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Title: COOPERATIVE EDUCATION

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# COOPERATIVE EDUCATION

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## STATEMENT OF WORK

### *M-3 FOCUSED EXPERIMENTS*

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*JUNE 24, 2021*



*The rising STAR of Texas*

## **1. INTRODUCTION AND BACKGROUND OF THE PROJECT**

M-3 Focused Experiments is a group at Los Alamos National Lab (LANL) and is under the Dynamic Experiments Division. Their work surrounds the diagnostics and study of explosives and their interaction with materials. The data collected is used to better understand the erratic nature of explosions and high velocity projectiles. Through better comprehension of this science, the overall national security will be improved while innovations are made along the way. Despite the strong drive for research and development, the lab holds safety above all else and constantly updates procedures to protect LANL employees and their environment. At any time, there are multiple projects going on at once within the team and I am tasked with assisting the Firing Site Leaders and various research diagnosticians in any way possible with the setup, testing, and execution of data collection for each experiment. Such data includes velocity, fragmentation characteristics, and the spread of energy across the material to name a few. During my summer employment with the lab, my main goal is to maintain a questioning attitude and learn as much possible about the research and development side of science and engineering. Throughout the duration of the Co-op, many experiments will take place at specially designed firing sites which is where I will be spending most of my time.

## **2. SCOPE OF WORK**

Los Alamos National Laboratories was initially organized during World War II to design nuclear weapons as part of the Manhattan Project back in 1943. Since then, the lab has branched out with numerous research programs across a variety of fields from biology to astrophysics. They all share the same goal in maintaining “the safety, security, and reliability of the nation’s nuclear deterrent without the need to return to underground testing.” Although it has been nearly 78 years since its initial emergence, LANL still regards the study and understanding of explosives as one of its top priorities in defending the nation. The main difference is that safety and technology has come a long way from its earlier days.

Many forms of data are being collected in the duration of a fraction of a second and much preparation is needed to prepare for an experiment. The diagnostics used for the projects come in a variety of forms such as fiber optics, flash x-ray radiography, and high speed photography. All of these diagnostics must be setup, troubleshot, and timed correctly in order to proceed with the experiment. The preparation process is what takes up the majority of the time when it comes to these projects and it is where my responsibilities mainly lie.

Deliverable: design and testing of diagnostic tool for the firing site, e.g. x-ray detector

### **3. PERIOD OF PERFORMANCE**

April 26<sup>th</sup> through August 10<sup>th</sup>, 2021. If possible, I will return to perform work at the labs during schooling breaks. Many projects will be completed throughout my time here.

### **4. PLACE OF PERFORMANCE**

I will be doing most of my work at Los Alamos National Laboratory firing sites although occasionally, I will work from home to complete required training.

### **5. WORK REQUIREMENTS, SCHEDULE AND MILESTONES**

In terms of schedules, I will be working a 9/80 which means I will work 9 days out of every two weeks and will work approximately 80 hours bi-weekly.

Requirements: complete all assigned training

Milestone: presentation in August on deliverable, either to M-3 group or student symposium

### **6. APPROVALS**

The signatures of the people below indicate an understanding in the purpose and content of this document by those signing it. By signing this document you indicate that you approve of the proposed project outlined in this Statement of Work.

| Printed Name | Title              | Signature | Date |
|--------------|--------------------|-----------|------|
| Caleb Solis  | Co-op Student      |           |      |
|              | Company Supervisor |           |      |